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made room for more interesting and important material. Particular attention is given to economic plants, especially those which have medicinal properties.

The number of illustrations has been increased from 686 to 741. Many of the old figures have been replaced by new ones, and the colored figures, which have always been a feature of the book, have been much improved by recent methods. Both authors and publishers deserve commendation for the frequent editions which have kept this work so thoroughly up to date.—C. J. CHAMBERLAIN.

Alpine vegetation.

ONE OF THE most valuable of tasks today is the compilation and systematization of scattered material. Such a labor has been performed by Marie Jerosch[4] in connection with the alpine vegetation of Switzerland. No claim to original work is put forth, although the critical study of 250 titles and the molding of discordant data into a harmonious whole are at least of equal value with most original investigations.

The work is essentially floristic rather than ecological. The first chapter deals with fundamental principles and motives, such as the origin of species, plant migrations, and polytopic appearance of species. The author is favorably inclined to all of the current evolutionary theories, and gives especial attention to Wettstein's seasonal dimorphism, and to mutation; the claim is made that Heer held a view essentially equivalent to mutation. The polytopic theory of Briquet is treated fully, but not very favorably. The second chapter considers the alpine and arctic climates from a comparative standpoint. The third and fourth chapters have to do with the Tertiary and Pleistocene history of the alpine regions. Then follows an account of postglacial changes, leading to a detailed consideration of the elements of the present alpine flora, together with their age and origin. Jerosch holds that an interglacial xerothermic or steppe period has been proved by the facts of plant geography, paleontology, and geology; there is more doubt as to a similar postglacial period.

There is no better illustration than that afforded by this book of the possibilities in floristic study. The glacial and postglacial floras of Switzerland and Scandinavia with all their vicissitudes are known almost as accurately as the floras actually in existence today. The fact that almost nothing is known of the glacial and early postglacial vegetation of America ought to stimulate many to study in this important and productive field.—H. C. COWLES.

Ecology of the Lena valley.

CAJANDER has given an excellent account of the vegetation of the alluvium of the lower Lena[5], in which particular attention is paid to the genetic relations of the plant associations. The headwaters of the Lena are in the steppe and the mouth is in the tundra, but most of the stream traverses a forest region. While larch, spruce, and pine dominate southward, the forests nearer the mouth are composed almost wholly of larch. Alluvial savannas decrease northward. Cajander employs "Bestand" in the ordinary sense, but uses "association" where most authors use "formation." "Series" is used for a group of genetically connected associations. The forest associations usually start with a thicket of *Salix viminalis*, which is succeeded by a mixed thicket, and later in turn by alders, birch, and spruce. The final stage on areas subject to overflow is a forest of spruce and larch; on alluvium above the freshet line there are pure larch forests. Various succession series are found in the meadows, differences being largely due to variations in the character of the soil; the final stages are very similar. An interesting variation in the succession series is shown by *Equisetum arvense* which precedes *Carex acuta* in rich soil, but comes after it in pure sand. In his concluding remarks, Cajander introduces the term "vicarious associations," by which he means associations that occupy similar places in the genetic series. Associations are climatically vicarious if they occur in different regions; *e.g.*, the *Carex acuta* association replaces northward the *Carex aquatilis* association of the upper Lena. One may cite as an illustration of edaphically vicarious associations the *Equisetum fluviatile* and Eleocharis associations which occupy a pioneer position in different soils of the same region.—H. C. COWLES.

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[4] JEROSCH, MARIE, Geschichte und Kerknuft der schweizerischen Alpenflora. Leipzig: Wilhelm Engelmann. 1903. *M* 8.

[5] CAJANDER, A. K., Die Alluvionen des unteren Lena-Thales. Helsingfors. 1903.

A flora of northwest America.[6]

THOMAS HOWELL, so long known as an indefatigable collector, has brought together the results of years of field experience in a large volume describing the flowering plants of Oregon, Washington, and Idaho, a corner of the United States that had been left unprovided with a handy manual. Aside from the need of a manual for this region, the flora is one of the most interesting within our boundaries. The first fascicle of the present work was issued in 1897, although we are informed that the actual writing of the flora began in 1882, and now the completed seven fascicles appear in the volume before us. The sequence is that of Bentham and Hooker, the nomenclature is conservative, and the conception of species has been held to the old lines. Of the 3,150 species and varieties described 89 are new, but Mr. Howell is further to be credited with having contributed to monographers many more new species of his collecting.

This volume has been published under such unusual conditions, which are nowhere referred to in it, that they should be recorded. In 1896, when the first fascicle was ready for the printer, no typesetter able to set the tech-

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[6] HOWELL, THOMAS, A flora of northwest America, containing brief descriptions of all the known indigenous and naturalized plants growing without cultivation north of California, west of Utah, and south of British Columbia. Vol. I. Phanerogamae. 8vo pp. 816. 1903. Portland, Oregon: The author. $5.00.